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EXAMINER	
MILLER, MARINA I	

ART UNIT	PAPER NUMBER
1631	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/816,755	VAIDEHI ET AL.	
	Examiner	Art Unit	
	Marina Miller	1631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 January 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3 and 35-62* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3 and 35-62* is/are rejected.

7)☒ Claim(s) *37* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Applicants filed a Request For Continued Examination under 37 C.F.R. § 1.114. Applicants' submission filed on 1/19/2006 is acknowledged. Claims 1, 3, and 35-62 are pending. Claims 2 and 4-34 are cancelled. Claims 1, 3, and 35-62 presently are under examination.

Applicants' arguments have been fully considered. Rejections and/or objections not reiterated from previous office actions are hereby withdrawn. The following rejections and/or objections are applied.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1, 3, and 35-62 rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claim 1 recites a method for predicting the structure of a membrane-bound protein comprising identifying a range of amino acids as transmembrane regions, constructing helices for the regions, optimizing a helix bundle configuration, constructing loops to generate a model, optimizing the model, thereby providing a predicted structure. However, not all processes are statutory under 35 U.S.C. 101. *See Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility.* 1300 O.G. 4, on 22 November 2005 (published at the USPTO web site http://www.uspto.gov/web/patents'patog/week47/OG/TOC.htm). If claims are directed to abstract ideas (such as mathematical algorithms), natural phenomena, and laws of nature, "[i]n evaluating whether a claim meets the requirement of section 101, the claim must be considered as a whole to determine whether it is for a particular application of an abstract ideas,

natural phenomena, or laws of nature." *Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility. Id.* section IV. C at 47-48 (the USPTO Web site's version). "To satisfy 101 requirements, the claim must be for a practical application ... which can be identified ... The claimed invention "transforms" an article or physical object to a different state or thing. [if not, then] The claimed invention otherwise produces a useful, concrete, and tangible result." *Id.* section IV. C. 2 at 48-49 (the USPTO Web site's version).

In the instant case, the claimed method steps "describe nothing more than the manipulation of basic mathematical constructs, the paradigmatic 'abstract idea.'" *Id.* section IV. B at 47 (the USPTO Web site's version). Specifically, the claimed method recites mathematical and/or statistical manipulations with amino acid sequences. The claimed method does not transform or reduce an article or a physical object (here, an amino acid sequence) to a different stage or thing (*e.g.*, protein, crystal structure corresponding to the prediction). The claims do not recite tangible expression (*i.e.*, real-world result) of optimizing the full-atom model, nor any recitation of an actual (*i.e.*, concrete) result in a form useful to one skilled in the art. Thus, the method does not recite steps of producing something that is concrete, useful, and tangible, and is not statutory.

For the reasons stated above, claims 1, 3, 35-62, and 64-66 are rejected as being directed to non-statutory subject matter.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it

pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1, 3, 35-62 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. This is a NEW MATTER rejection.

Claim 3, as amended, recites the limitation "constructing ... includes one or more of: constructing ... canonical helices, ... calculating a minimal-energy configuration for each ... helices... and optimization the canonical helices." Claim 35, as amended, recites "optimizing a helix bundle configuration includes one or more of: assembling a helix bundle ... and calculating a minimal-energy configuration." The newly added limitations do not have support in the specification, claims, or drawings, as originally filed. Applicants pointed to [0015] for support in the originally filed disclosure for the claim amendments. The examiner reviewed the cited section and the entire original application, but did not find support for the new limitation. The examiner interprets the limitation "include" as an open language limitation equivalent to "comprise." The original specification discloses and original claim 3 recited that constructing the set of helices can include constructing canonical helices, calculating a minimal-energy configuration for each helix, optimizing each of the canonical helices, assembling a helix bundle, and calculating a minimal-energy configuration for the bundle [0015]. Thus, the originally filed claims supports only constructing which comprises at least constructing canonical helices, calculating a minimal-energy configuration for each helix, optimizing each of the canonical helices, assembling a helix bundle, and calculating a minimal-energy configuration for the

bundle, but does not support "constructing" helices wherein a subset of "one or more" steps from the list disclosed in original claim 3 or the originally filed specification, section [0015], is(are) chosen.

For these reasons, the claims are rejected for reciting new matter.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 3, and 35-62 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1, as amended, recites method steps of identifying, constructing helices, optimizing, constructing a model, and optimizing the model "thereby providing a predicted structure." It is not clear whether the limitation "thereby providing" is intended to be an active, positive step of the claimed method. As the intended limitation is not clear, claims 1, 3, and 35-62 are indefinite.

Claim Rejections - 35 USC § 102

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1, 35-38, 41-42, 44, 46, 48, and 51-58 are rejected under 35 U.S.C. 102(b) as being anticipated by Biggin, *Biophysical Chemistry*, 76:161-183 (1999).

Basis for rejection

Biggin teaches the method of claims 1, 36-38, 41-42, 44, 46, 48, and 51-58, as set forth in the previous office actions. Claim 35, as amended, now depends from claim 1. Biggin discloses optimizing a helix bundle configuration comprising assembling helix bundles (p. 177). Thus, Biggin anticipates the method of claims 1, 35-38, 41-42, 44, 46, 48, and 51-58.

Response to arguments

Claims 1, 36-38, 41-42, 44, 46, 48, and 51-58 were previously rejected as being anticipated by Biggin. Applicants argue that Biggin does not disclose a method for predicting a structure of a membrane-bound protein. Specifically, applicants argue that Biggins does not disclose identifying a range of amino acids in a sequence of membrane-bound proteins because Biggins merely lists sequences of helices and does not show how such sequences were identified. Applicants state that identification of transmembrane (TM) regions can be carried out as described in the specification [0028] and no such method is disclosed or described by Biggin. Applicants further argue that Biggin does not disclose constructing helices because a "constructing" step comprises using at least secondary structure modeling techniques (as disclosed in the specification, [0029]) and no such techniques are disclosed in Biggin. Applicants also argue that Biggin does not disclose constructing one or more inter-helical loops because this step typically comprises using "loop-building software (specifically [disclosed] at paragraph [0032], page 15 [of the instant specification]). No such technique is disclosed by Biggin." (page 12 of the response). Applicants' arguments have been considered, but are found not persuasive.

In response to the arguments, it is noted that the step of "identifying ... sequence of the membrane protein as transmembrane regions," as claimed, does not require showing how such

sequences have been identified, *i.e.*, the methods of identifying disclosed in the specification are not recited in the instant claims. Table 1 in Biggin discloses transmembrane regions of membrane-bound proteins (*i.e.*, the regions are identified because they are deduced from the full-length proteins). Applicants are reminded that limitations from the specification may not be "read into" the claims. Thus, the examiner maintains that Biggin discloses identifying sequence of the membrane protein as transmembrane regions for the reasons stated above and in the previous office actions.

In response to further arguments, it is noted that Biggins discloses the step of "constructing helices in asset of helices for transmembrane regions." Specifically, Biggin discloses constructing isolated trenamembrane helices (p. 162, right col.; p. 163, top of left col.; p. 164-165 and fig. 2-3, p. 173; *also see* "TM Helices in Full Bilayers" simulation studies, p. 172-175) and bundles (p. 177-180). The claimed method does not recite using a specific technique for "constructing" helices, *e.g.*, secondary structure modeling disclosed in the instant specification. Thus, the examiner maintains that Biggin discloses constructing helices regions for the reasons stated above and in the previous office actions.

It is also noted that Biggn discloses constructing one or more inter-helical loops. Specifically, Biggins discloses a simulation study wherein the study, which started from a helix bundle model of four exactly parallel, ideal helices, transformed the helices after unrestrained molecular dynamics simulations into an evolved coiled-coil tetrameric structure with a left handed twist (*i.e.*, a loop). It is also noted that the claimed method does not recite using "loop-binding software." Thus, the examiner maintains that Biggin discloses constructing one or more inter-helical loops for the reasons stated above and in the previous office actions.

Applicants admit that Biggin teaches other steps of the claimed method recited in claim 1 (*see* p. 11-12 of the response).

To answer further applicants' arguments, *i.e.*, that Biggin does not teach a method for predicting a structure of a membrane-bound protein (p. 12-14 of the response), it is noted that Biggin teaches modeling and simulation of a membrane-bound protein structure in various environments (p. 162, left col. and p, 171). Bigin also teaches simulation studies of TM helices and bundles (p. 171-172; 174; 177-179). It is noted, that the preamble recites a "method for predicting" which states an intended use of the method. The method actually does not have an active, positive step of "predicting" a structure, but only results in optimizing the full-atom model, which step is disclosed in Biggin on p. 170-171. Thus, the examiner maintains that Biggin anticipates the claimed method steps for the reasons stated above and in the previous office actions.

Regarding the limitation recited in claim 37, Biggin discloses alignment of an amino acid sequence with that of an experimental or theoretical helical template (*see* p. 174 where Biggin discloses using known structure to define TM helices of an unknown sequence). Thus, Biggin anticipates claim 37.

Regarding the limitation recited in claim 38, Biggin discloses periodicity of proline residue (a hydrophobic residue) in a helix (p. 166, left col.) and the simulation of the insertion of a hydrophobic helix (166, right col.). Thus, Biggin anticipates claim 38.

Regarding the limitation recited in claim 41, Biggin discloses constructing helices using determining 3D coordinates that define the structure of helices (p. 173-174, and fig. 6). Thus, Biggin anticipates claim 41.

Thus, the examiner maintains that Biggin anticipates claims 1, 36-38, 41-42, 44, 46, 48, and 51-58 and rejects claim 35.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 39-40 and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Biggin, *Biophysical Chemistry*, 76:161-183 (1999), as applied to claims 1, 35-38, 41-42, 44, 46, 48, and 51-58, in view of Mathiowetz, *Proteins: Structure, Function, and Genetics*, 20:227-247 (1994), and further in view of Sansom, *Biophys. J.*, 68:1295-1310 (1995).

Basis for rejection

Biggin teaches the method of claims 1, 35-38, 41-42, 44, 46, 48, and 51-58, as set forth above.

Biggin does not teach optimizing helices using a torsional molecular dynamics method, and specifically Newton-Euler Inverse Mass Operator (NEIMO) or Cell Multipole Method (CMM).

Mathiowetz discloses a new method for dynamics simulations of proteins, and specifically NEIMO and CMM.

It would have been obvious to one of ordinary skill in the art at the time of the instant invention to modify the method of Biggin to apply methods of dynamic simulations for

constructing helices of transmembrane proteins in structure modeling study, such as taught by Mathiowetz, where the motivation would have been to improve simulations of large proteins and eliminate problems pertinent to high energy models, as taught by Mathiowetz, p. 227. One of ordinary skill in the art would have had a reasonable expectation of success in combining the teaching of Biggin and Mathiowetz because molecular dynamic simulations disclosed by Mathiowetz were successfully applied to a wide range of peptide and protein systems including $(Ala)_9$ helices wherein (Ala) composed helices are used as a model for simulating structures of transmembrane protein helices and bundles, as taught by Sansom, p. 1297.

Response to arguments.

The claims were rejected over Biggin and Mathiowetz in the previous office actions. Applicants argue that there is no motivation to combine the references because (1) neither Biggin nor Mathiowetz discloses how to combine the inventions, and (2) Mathiowetz addresses a different problem in the art from the problem addressed by Biggin. Applicants' arguments have been considered, but are found not persuasive.

Applicants are reminded that the rejection is made under 35 U.S.C. 103(a) over a combination of references.

"The prior art can be modified or combined to reject claims as prima facie obviousness as long as there is a reasonable expectation of success." MPEP § 2143.02.

"Obviousness does not require absolute predictability, however, at least some degree of predictability is required." MPEP § 2143.02.

Prior art does not have to show how to combine as long as a reasonable expectation of success is shown for the combination of disclosures. Motivation to combine and reasonable

expectation of success statements are provided above.

Regarding the second argument, the skilled artisan would necessarily have considered the prior art generally available at the time of the invention regarding known methods of simulation commonly used for simulating large variety of protein. Such a person would not have limited their scope of knowledge only to what was known in the prior art regarding the mean field or all-atom calculation.

This conclusion is supported by the MPEP § 2141.01(a)[R-2], which states, "The Examiner must determine what is 'analogous prior art' for the purpose of analyzing the obviousness of the subject matter at issue. 'In order to rely on a reference as a basis for rejection of an Applicant's invention, the reference must either be in the field of Applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the inventor was concerned.' ... 'A reference is reasonably pertinent if, even though it may be in a different field from that of the inventor's endeavor, it is one which, because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering his problem."

Thus, the examiner maintains that the combination of Biggin and Mathiowetz is proper because it pertains to the field of molecular simulation of various proteins. For these reasons, claims 39-40 and 50 are rejected.

Claim 47 is rejected under 35 U.S.C. 103(a) as being unpatentable over Biggin, *Biophysical Chemistry*, 76:161-183 (1999), as applied to claims 1, 35-38, 41-42, 44, 46, 48, and 51-58 above, in view of Mayo, *J. Phys. Chem.*, 94:8897-8909 (1990).

Basis for rejection

Biggin teaches the method of claims 1, 35-38, 41-42, 44, 46, 48, and 51-58, as set forth above.

Biggin does not teach DREIDING and CHARMM22 force fields for predicting the structures.

Mayo discloses DREIDING and CHARMM22 force fields for predicting the structures and dynamics of molecules, (*see* abstract).

It would have been obvious to one of ordinary skill in the art at the time of the instant invention to modify the method of Biggin to apply DREIDING and CHARMM22 force fields, such as taught by Mayo, where the motivation would have been to facilitate prediction of structures for molecules where there are little or no experimental data, as taught by Mayo, p. 8897. One of ordinary skill in the art would have had a reasonable expectation of success in combining the teaching of Biggin and Mayo because a generic DREIDING (the atom types) approach is useful for predicting structures and dynamics of organic, biological, and main-group inorganic molecules as taught by Mayo, p. 8897.

Response to arguments

The claim was rejected over Biggin and Mayo in the previous office actions. Applicants argue that there is no motivation to combine the references because (1) neither Biggin nor Mathiowetz discloses how to combine the inventions, and (2) Mayo addresses DREIDING as an application of generic field force in vacuum or crystal for drug design while Biggin addresses mean field simulation of proteins in lipid environment. Applicants' arguments have been considered, but are found not persuasive.

Applicants are reminded that the rejection is made under 35 U.S.C. 103(a) over a

combination of references. "The prior art can be modified or combined to reject claims as prima facie obviousness as long as there is a reasonable expectation of success." MPEP § 2143.02. Prior art does not have to show how to combine as long as a reasonable expectation of success is shown for the combination of disclosures of references. Motivation to combine and reasonable expectation of success statements are provided above.

Regarding the second argument, Mayo discloses that in specialized force fields such as CHARMM or AMBER, there are often subtle distinctions in force constants and geometric parameters for similar atoms in slightly different environments, and it is often not clear how to generalize for new atoms or new bond types (p. 8897). In order to facilitate prediction of structures for molecules where there are little or no experimental data, Mayo discloses a general approach to force fields using parameters that are deliberately restricted to very simple rules (p. 8897).Thus, Mayo's approach is generic wherein atoms with the same atom type are treated identically in the molecular mechanics force field (see the standard atom types in table 1). Further, DREIDING is useful for predicting structures and dynamics of organic, biological, and main-group inorganic molecules. It uses general force constants and geometry parameters based on simple hybridization considerations rather than individual force constants and geometric parameters that depend on the particular combination of atoms involved in the bond, angle, or torsion terms. Thus, parameters are defined for all possible combinations of atoms and new atoms can be added to the force field rather simply (*see* abstract). Thus, the fact that Mayo discloses only examples of predicting the structures of 76 organic molecules does not restrict the application of DREIDING force field to small molecules and the drug design endeavor because the force field is generic and is easily adjustable. Moreover, Mayo predicted the structure of 76

molecules using DREIDING in crystal and in vacuum in order to assess the efficiency of the DREIDING force field because the crystal structure of 76 molecules is available from the Cambridge Data Base.

Thus, the examiner maintains that combining Mayo with Biggin is proper because Mayo pertains to the field of molecular simulation of various organic systems (p. 8909). For these reasons, the examiner maintains that Biggin and Mayo make obvious claim 47.

New Rejections

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Biggin, *Biophysical Chemistry*, 76:161-183 (1999), as applied to claims 1, 35-38, 41-42, 44, 46, 48, and 51-58, in view of Benner, US 5,958,784.

Biggin teaches the method of claims 1, 35-38, 41-42, 44, 46, 48, and 51-58, as set forth above.

Biggin does not teach canonical helices.

Benner discloses predicting folded structure of proteins (abstract). Benner discloses aligning sequences of homologous proteins (col. 4, lines 35-37). Benner discloses constructing canonical helices (col. 16, lines 1-40).

It would have been obvious to one of ordinary skill in the art at the time of the instant invention to modify the method of Biggin to construct canonical helices, such as taught by Benner, where the motivation would have been to improve positional helix assignment, as taught by Albert, col. 16, lines 25-63. One of ordinary skill in the art would have had a reasonable expectation of success in combining the teaching of Biggin and Benner because similar problems

of positional assignment are expected when the protein interacts with a membrane, as taught by Benner, col. 16, lines 61-63.

Claim 45 is rejected under 35 U.S.C. 103(a) as being unpatentable over Biggin, *Biophysical Chemistry*, 76:161-183 (1999), as applied to claims 1, 35-38, 41-42, 44, 46, 48, and 51-58 above, in view of Turner, US 5,424,963.

Bigging teaches the method of claims 1, 35-38, 41-42, 44, 46, 48, and 51-58, as set forth above.

Biggin does not teach a rigid body molecular dynamics simulation.

Turner discloses a molecular dynamics simulation method wherein the model data is defined by rigid bodies corresponding to groups of atoms on the molecule with substantially no relative movement between atoms (abstract, col. 15-16).

It would have been obvious to one of ordinary skill in the art at the time of the instant invention to modify the method of Biggin to apply a rigid body molecular dynamics simulation, such as taught by Turner, where the motivation would have been to reduce the degree of freedom in a complex molecular system down to a manageable size so that protein conformation changes can be studies at any desirable level of detail, as taught by Turner, col. 3, lines 45-65.

Claim 49 is rejected under 35 U.S.C. 103(a) as being unpatentable over Biggin, *Biophysical Chemistry*, 76:161-183 (1999), in view of Mathiowetz, *Proteins: Structure, Function, and Genetics*, 20:227-247 (1994) and Sansom, *Biophys. J.*, 68:1295-1310 (1995), as

applied to claims 1, 35-42, 44, 46, 48, and 50-58 above, and further in view of Turner, US 5,424,963.

Biggin, Mathiowetz, and Sansom make obvious the method of claims 1, 35-42, 44, 46, 48, and 50-58, as set forth above.

Biggin, Mathiowetz, and Sansom do not disclose a rigid body molecular dynamics simulation.

Turner discloses a molecular dynamics simulation method wherein the model data is defined by rigid bodies corresponding to groups of atoms on the molecule with substantially no relative movement between atoms (abstract, col. 15-16).

It would have been obvious to one of ordinary skill in the art at the time of the instant invention to modify the method of Biggin, Mathiowetz, and Sansom to apply a rigid body molecular dynamics simulation, such as taught by Turner, where the motivation would have been to reduce the degree of freedom in a complex molecular system down to a manageable size so that protein conformation changes can be studies at any desirable level of detail, as taught by Turner, col. 3, lines 45-65.

Conclusion

No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marina Miller whose telephone number is (571)272-6101. The examiner can normally be reached on 8-5, M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ardin Marschel, Ph. D. can be reached on (571)272-0718. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Marina Miller
Examiner
Art Unit 1631

MM

MARJORIE A. MORAN
PRIMARY EXAMINER

3/13/06